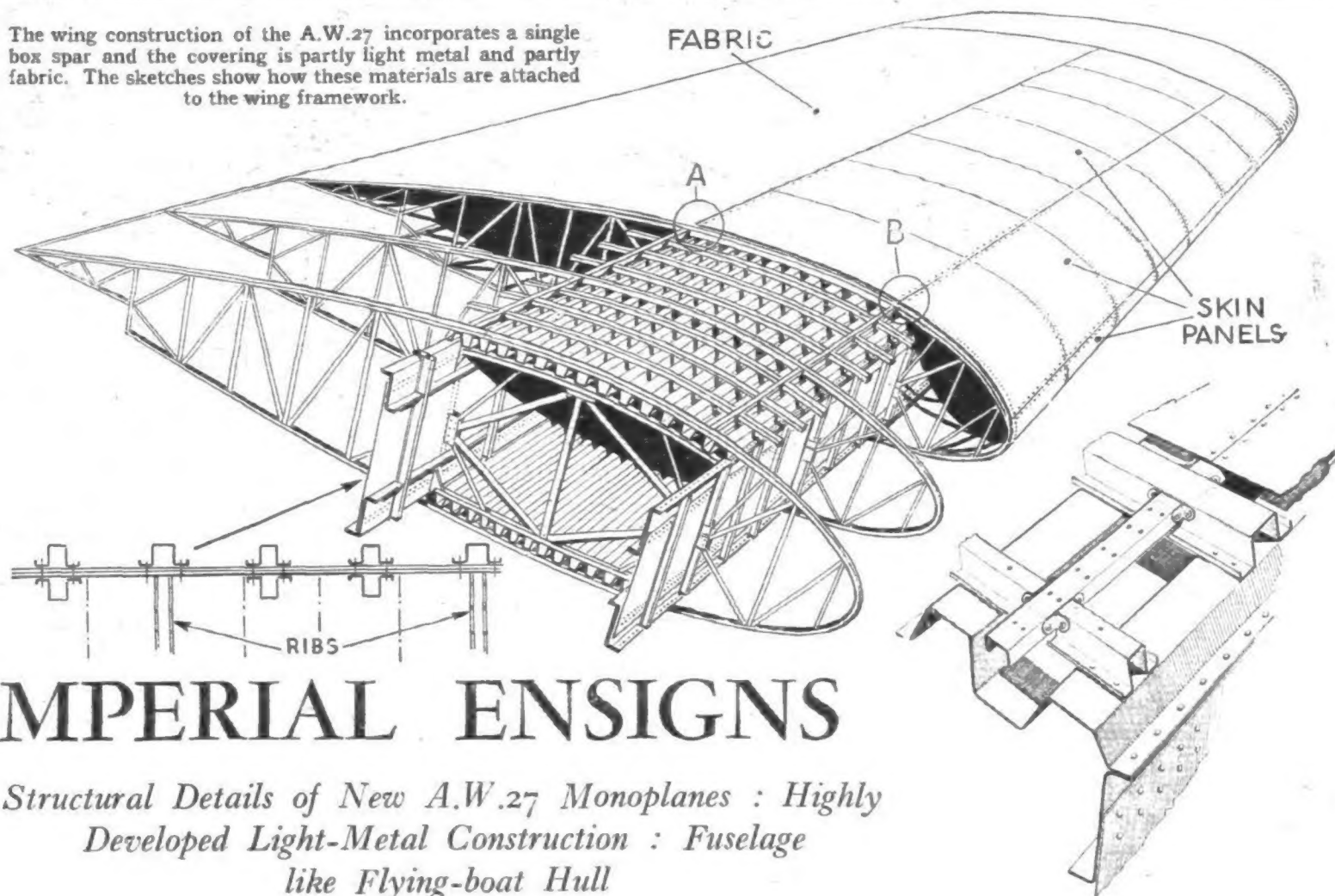


The wing construction of the A.W.27 incorporates a single box spar and the covering is partly light metal and partly fabric. The sketches show how these materials are attached to the wing framework.



IMPERIAL ENSIGNS

Structural Details of New A.W.27 Monoplanes : Highly Developed Light-Metal Construction : Fuselage like Flying-boat Hull

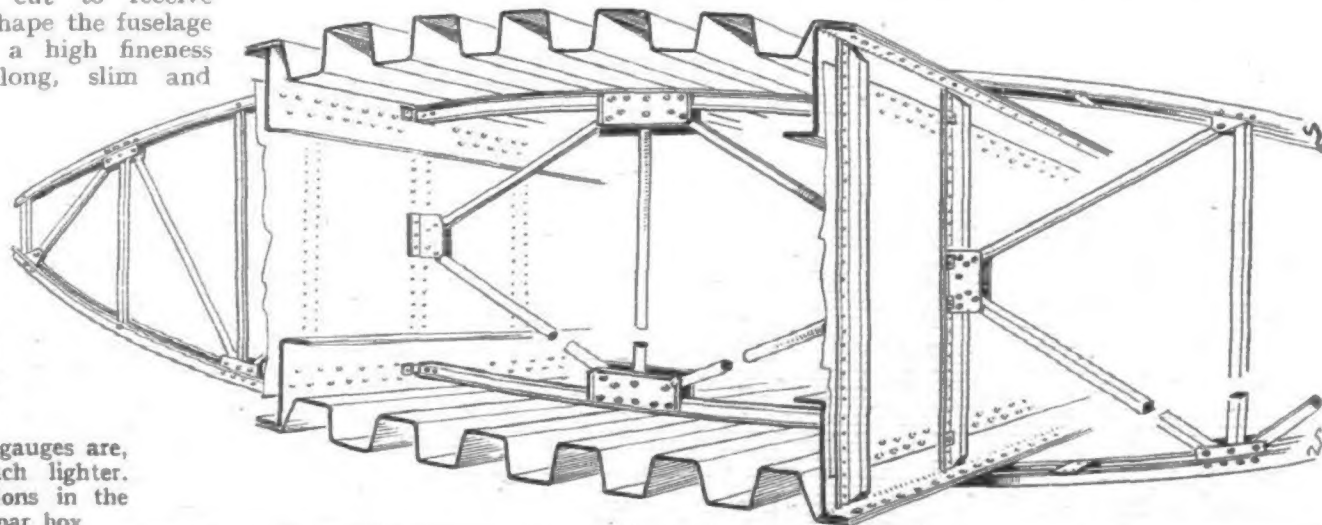
WORK is progressing rapidly at Hamble on the new landplanes which Armstrong Whitworths are building for Imperial Airways, and the first of the twelve machines should be flying fairly soon. With a gross weight of approximately 20 tons, these machines will have a performance almost identical with that of the Empire boats, i.e., a top speed of about 200 m.p.h. and a cruising speed of something like 160 m.p.h.

For use on the European routes, the *Ensign* class, as the A.W.27 will be called after the first machine, will carry 40 passengers, while on the Empire routes accommodation will be provided for 27 passengers by day and 20 by night.

Some very interesting structural features are incorporated in the construction of the A.W.27. The fuselage is a stressed-skin shell, with the longitudinal stringers running through from end to end and joggled into the frames, which are cut to receive them. In external shape the fuselage is characterised by a high fineness ratio, being very long, slim and

graceful in appearance. In the construction of the wing the Armstrong Whitworth designers have shown a great deal of originality, and although specific figures may not be published at present it can be said that the strength-weight ratio of the A.W. type of wing construction is very good. Fundamentally, it consists of a single large box spar of light-metal construction to which are attached the front and rear portions of the wing ribs. The wing construction forms, in fact, an intermediate stage between the stressed-skin multi-spar type and what Dr. Lachmann, in his recent paper, called the "concentrated flanges" type. It also affords an interesting comparison with the type of construction employed in the Short Empire boats.

Where Mr. Gouge employs extruded I-sections at the spar corners and ties them together with fork-ended tubes which form a girder, Mr. Lloyd uses Z-sections at



The construction of the tail follows the same general system as that used in the main wing, but the gauges are, of course, very much lighter. Note the "Z" sections in the corners of the spar box